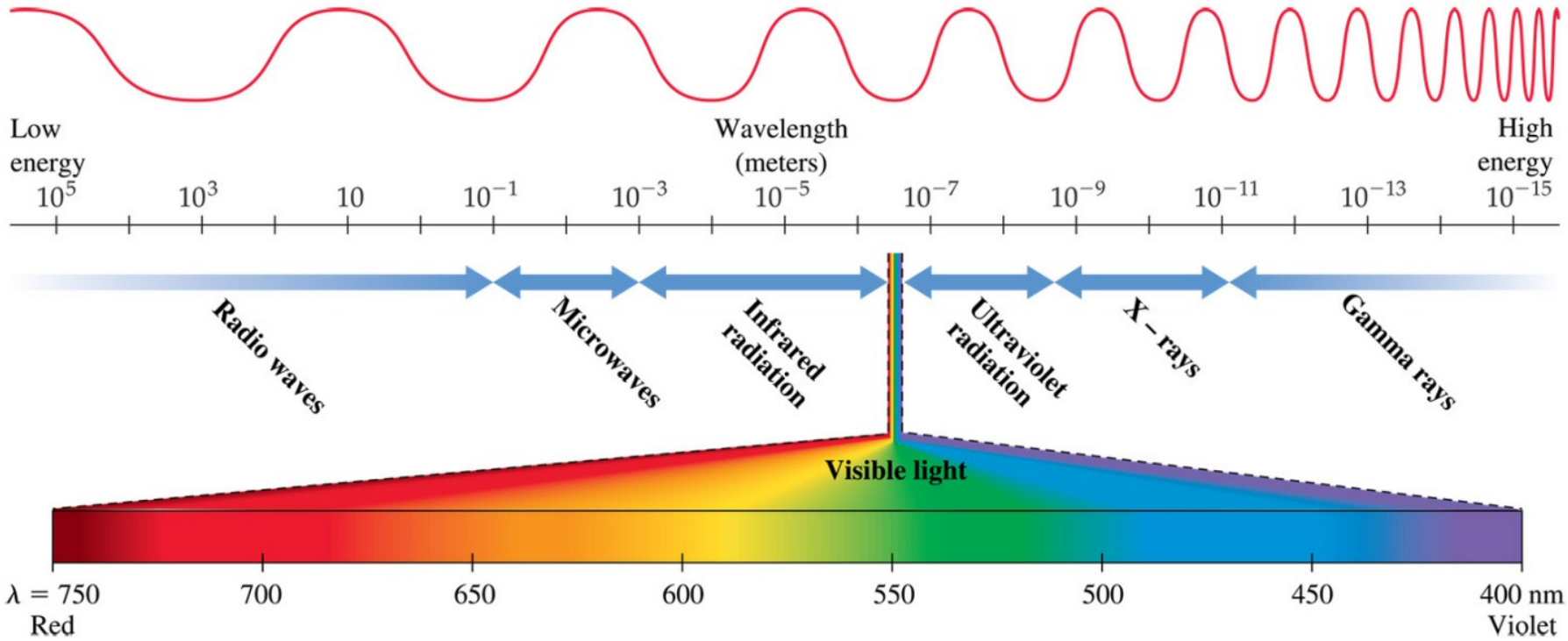
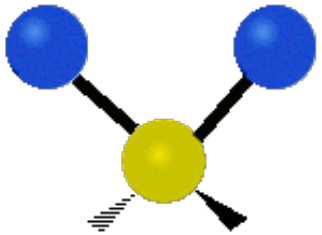
Electromagnetic Spectrum

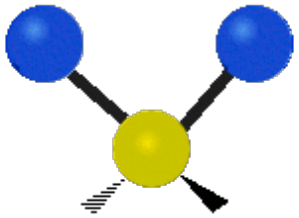


R O Y G B I V

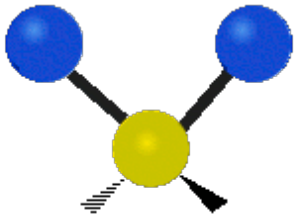
Vibrational Modes



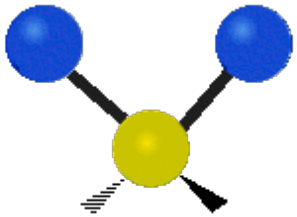
Symmetrical Stretching



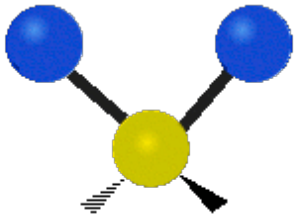
Asymmetrical Stretching



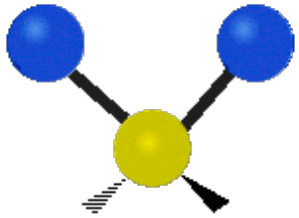
Rocking



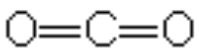
Scissoring



Wagging

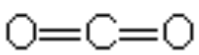


Twisting



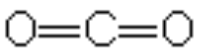
symmetric stretch

IR Inactive

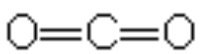


antisymmetric stretch

IR Active



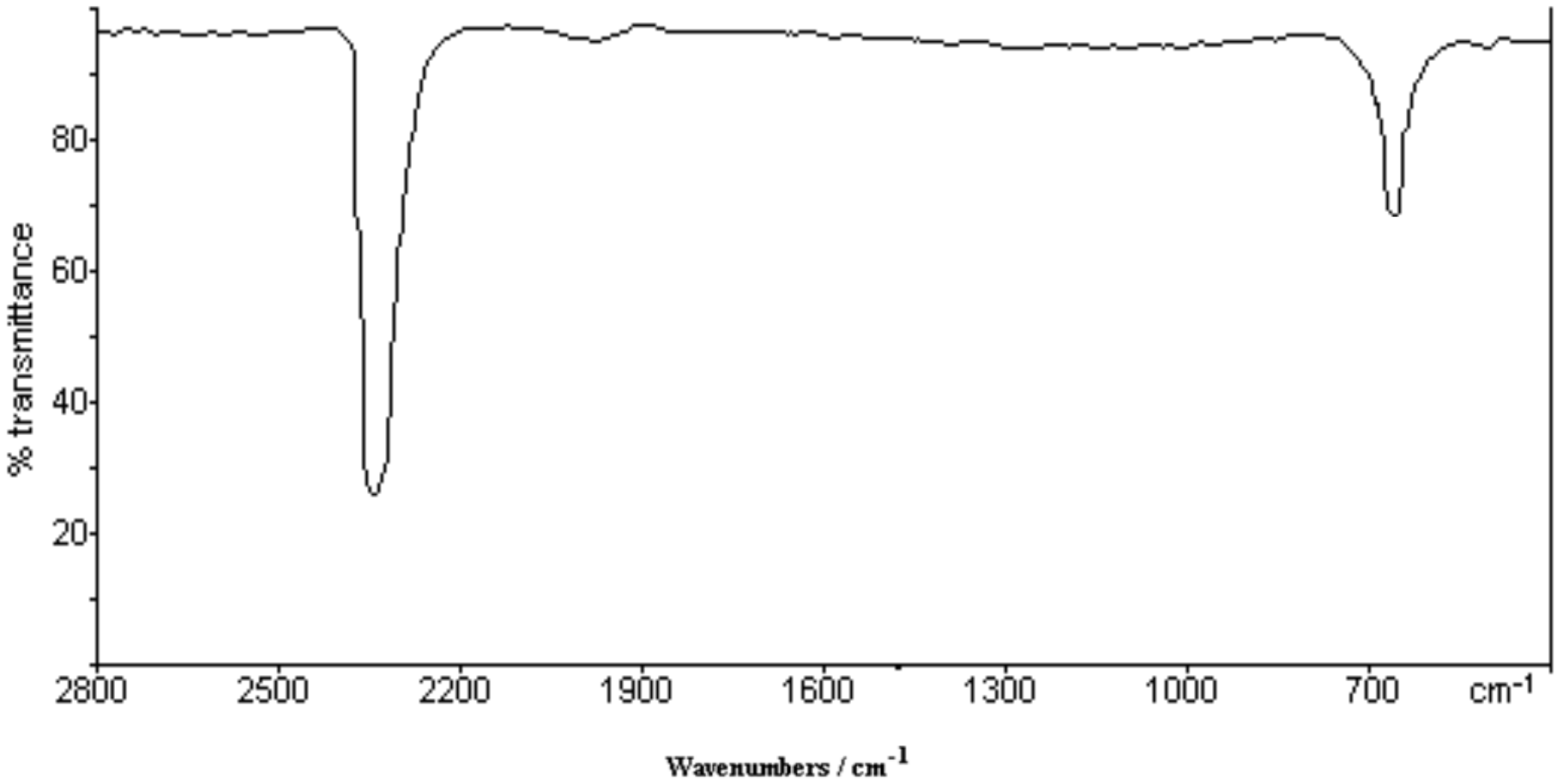
δ_{xz}



δ_{xy}

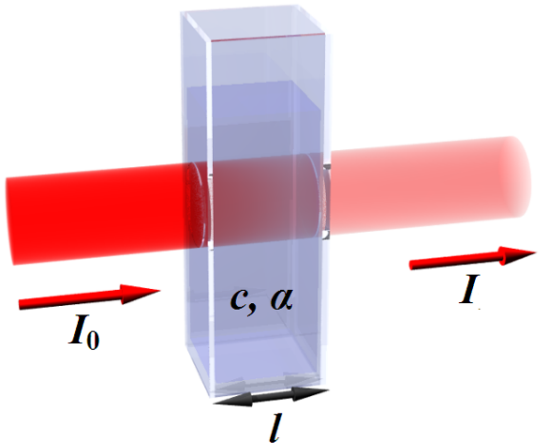
IR Active

IR Spectrum


% transmittance
80
60
40
20
2800
2500
2200
1900
1600
1300
1000
700
cm-1
Wavenumbers / cm-1

Y- axis: Transmittance

$$\% T = \frac{I}{I_0} \times 100\%$$



I = Intensity of light after it passes through the sample

I_0 = Intensity of light before it passes through the sample

X- axis: Wavenumber

$$\tilde{\upsilon} = \frac{1}{\lambda}$$

Units: cm^{-1}

$$E = h\nu = \frac{hc}{\lambda} = hc\tilde{\upsilon}$$